United States Environmental Protection Agency
Criminal Investigation Division

0606-0015
Case Number

Investigative Activity Report

Case Title:
CES Environmental Services

Reporting Office:
Dallas Area Office

Subject of Report:
Interview of KMTX Officials at Port Arthur, TX

Copies to:
SA (b) (6), (b) Houston RAC

Related Files:

Reporting Official and Date:
(b) (6), (b) (7)(C)
SA (b) (6), (b) (7)(C) 08/07/09

Approving Official and Date:
(b) (6), (b) (7)(C) 8/07/09
ASAC (b) (6), (b) (7)(C)

SYNOPSIS

Officials of KMTX were interviewed concerning contents of KMTX tanks rented to CES-PACES for storage of liquids.

DETAILS

During execution of a search warrant at the CES-PACES facility at Port Arthur, Texas, an unsigned KMTX letter to CES official (b) (6), (b) (7) was discovered that indicated a likelihood that PACES was storing liquids in tankage at KMTX.

On 08/05/09, (b) (6), (b) (7)(C), TCEQ Investigations Manager, and I personally interviewed KMTX Plant Manager (b) (6), (b) (7) (telephone (b) (6), (b) (7)), and Logistics Manager (b) (6), (b) (6), (b) (telephone (b) (6), (b) (7)). The KMTX plant is located on the south property bordering the CES-PACES facility.

(b) (6), said a contract with PACES limited the material that could be stored in rented KMTX tanks.

(b) (6), (b) agreed to provide the most recent inventory of KMTX tanks rented by PACES. That August 2009 inventory indicated sulfidic caustic (1 tank) and phenolic caustic (2 tanks) that (b) (6), (b) said (b) understood to be "available for processing or shipment to a paper mill." He said MSDS documents were available for liquids stored in KMTX tanks, and produced copies of the following: "Weak Sulfidic Caustic" MSDS, "CES Low Flash Recovered Black Oil" MSDS, "CES Recovered Oil (Grade II)" MSDS, "Sodium Hydrosulfide Solution" MSDS, and Phenolic Caustic Solution" MSDS. (b) (6), and (b) (6), (b) firmly stated that KMTX does not use, process, or have any interest in PACES liquids stored in KMTX tanks.

It was noted that the MSDS indicated pH range for sulfidic caustic and phenolic caustic was 11.5-13.5, respectively.

(b) (6), (b) said PACES could add to or take from contents of KMTX tanks by tanker truck only. He said tanker trucks were weighed in and out from KMTX, because PACES was billed for quantities in storage, as well as quantities transferred. He noted that some of the cargos delivered to KMTX tanks were transferred from barges.

(b) (6), (b) said KMTX keeps "retains" for 6 months from the transfer loads, explaining that "retains" are grab samples taken from loads going in and out of the KMTX facility. He said KMTX ran no lab tests on those samples.

Subsequent to consideration of information received from SA (b) (6), (b) that some of the PACES liquids stored in KMTX tanks was possibly being stored because it was unusable, (b) (6), (b) was again contacted by telephone to inquire if he could provide a record of cargo transfers in and out of the rented KMTX tanks. (b) (6), (b) agreed to provide the April tankage inventory, and records of transfers for May, June, and July 2009.

Later the same day, the following were received from (b) (6), (b) April Inventory, May Receipts, May Shipments, June receipts, July Receipts, and July Shipments. (b) (6), (b) commented the frequency of transfers had slowed in the last few months.

Attachments:
Copy of KMTX letter seized in PACES Search (2 pp.)
April Inventory (1 pg.)
May Receipts (1 pg.)
May Shipments (3 pp.)
June receipts (1 pg.)
July Receipts (1 pg.)
July Shipments (1 pg.)
August Inventory (1 pg.)
Weak Sulfidic Caustic MSDS (6 pp.)
CES Recovered Oil (Grade II) MSDS (3 pp.)
CES Low Flash Recovered Black Oil MSDS (3 pp.)
Sodium Hydrosulfide Solution MSDS (9 pp.)
Phenolic Caustic Solution MSDS (6 pp.)

KMCO KMTEX

Specialty Chemicals and Manufacturing

Thursday, April 2, 2009

(b) (6), (b) (7)
CES Environmental Services, Inc.
4904 Griggs Rd
Houston, TX 77021

(b),

KMTEX appreciates the opportunity to propose pricing for spent caustic materials terminalling project. The following is a proposed agreement for the project:

1. **FACILITY**: The terminalling will be done at the KMTEX plant in Port Arthur, TX.
2. **MATERIAL**: Spent Caustic and residual materials from processing supplied by CES via truck, rail and barge.
3. **TERM:** This agreement is effective April 1, 2009 and runs through December 31, 2009.
4. **FEES:** KMTEX will charge a discounted rate of $30,000 per month for the following five (5) tanks throughout the term of this agreement:
    a. Tanks 600 and 601 (73,000 gallon capacity each)
    b. Tanks 606 and 607 (11,000 barrel capacity each)
    c. Tank 166 (50,000 gallon capacity)
    d. Should CES require additional tankage during the term of this agreement, KMTEX reserves to the right to make such tanks available for service at the following rental rates:
        i. 27,000 gallon Carbon Steel Tank - $2,500 per month
        ii. 50,000 gallon Carbon Steel Tank - $3,500 per month
        iii. 60,000 or 70,000 gallon Carbon Steel Tank - $4,000 per month
        iv. 11,000 barrel Carbon Steel Tank - $11,000 per month
        v. 60,000 gallon Stainless Steel Tank - $4,500 per month
5. **MATERIAL HANDLING FEES**:
    a. $.01 per gallon for loading / unloading of barges
    b. $.02 per gallon for loading / unloading of trucks and railcars
    c. Minimum charge for such movements is $95
    d. A line may be added to pump caustic to the CES feed vessel directly from KMTEX storage tanks. These volume of these transfers will be based upon tank gauges and incur a $0.02 per gallon fee. This will decrease to .01 /gal. if contract extended. T.M.B.

6. **MISCELLANEOUS FEES:**
    a. Heating of Trucks or Railcars with Steam: $100 per hour
    b. Mixing of Tanks with Nitrogen: $100 per hour
    c. Cancelled or Unscheduled Load Fee: $100 per event
    d. Tank to Tank Transfers: $750 per transfer
    e. Sample Shipments: KMTEX cost plus 15%
7. **YIELD:** Yield loss from shipping and receiving will not exceed 1%.
8. **FREIGHT:** All raw materials are delivered to KMTEX free of charge and all product shipments are made on an FOB KMTEX basis.
9. **TRANSPORTATION MODES:** All material will be delivered via truck, rail or barge and will ship out via truck, rail or barge.
10. **FREIGHT:** Demurrage, if occurs, will be discussed on a case-by-case basis regarding responsibility.
11. **PRODUCTION ACCOUNTING:** KMTEX will supply a monthly summary of receipts, inventory, and shipments.
12. **ACCOUNTING:** Payment terms are Net 30 days from date of invoice.
13. **GENERAL:** All product shipments and material deliveries must be scheduled to avoid additional charges. KMTEX hours of operation for shipping product are 7:00 AM through 5:00 PM, Monday through Friday. KMTEX's hours of operation for receiving materials are 24 hours per day, Monday through Friday, and processing are 24 hours per day, 7 days a week.
14. **ENERGY SURCHARGE:** An energy surcharge will not be charged for this project.
15. **AGREEMENT:** KMTEX typical "Force Majeure", Governance, and "Indemnification Clause" apply to this transaction.

Executed this _____ day of, 2009 ("Effective Date") at Houston, Texas

CES Environmental Services, Inc.	**KMTEX**
By:_____	By:_____
Printed Name: _____	(b) [redacted]
Title:_____	Business Development Manager

CES Inventory

April

PRODUCT	TANK/ RAILCAR #	NET WEIGHT	PRODUCT TOTAL	# per Gal	Gallon
NASH	T-166	0	0	10.11	0
RECOVERED BLACK OIL	T-167	347,981	347,981	7.34	47,409
CES FUEL	T-181	218,189	218,189	6.73	32,420
Sulfidic Caustic	T-607	2,893,123	2,893,123	9.46	305,827
Phenolic Caustic	T-222	966,984		9.52	101,574
Phenolic Caustic	T-606	4,162,814	5,129,798	9.52	437,270
ORGANO SULFUR FEEDSTOCK	T-601	484,340	484,340	7.10	68,217
LOW FLASH OIL	T-600	634,778	634,778	8.69	73,047

May **CES Receipts**

RECEIPT DATE	RECEIVED FROM	PRODUCT	TO TANK	CARRIER TRLR/ R/C #	NET WEIGHT	PRODUCT TOTAL	ORDER #
5/15/2009	CES Environmental - Port Arthur	CES FUEL	181	CES 262	39,200		86218
5/15/2009	CES Environmental - Port Arthur	CES FUEL	181	CES 262	36,160		86251
5/18/2009	CES Environmental - Port Arthur	CES FUEL	181	CES 262	37,540		86336
5/19/2009	CES Environmental - Port Arthur	CES FUEL	181	CES 259	49,700		86346
5/19/2009	CES Environmental - Port Arthur	CES FUEL	181	CES 259	20,340		86347
5/20/2009	CES Environmental - Port Arthur	CES FUEL	181	CES 259	36,540		86388
5/20/2009	CES Environmental - Port Arthur	CES FUEL	181	CES 259	43,140		86391
						262,620	
5/7/2009	TRANSFER	Organo Sulfur Feedstock	166	from CES Fuel	218,189		
5/6/2009	CES Environmental - Port Arthur	Organo Sulfur Feedstock	166	CES 262	50,340		85745
5/6/2009	CES Environmental - Houston	Organo Sulfur Feedstock	166	CES 233	5,460		85741
						273,989	
5/14/2009	CES Environmental - Port Arthur	Phenolic Caustic	606	CES 254	45,520		86134
						45,520	
5/7/2009	CES Environmental - Port Arthur	Sulfidic Caustic	607	CCL 26	814,875		
5/12/2009	CES Environmental - Houston	Sulfidic Caustic	607	CES 607	36,840		86018
5/21/2009	CES Environmental - Port Arthur	Sulfidic Caustic	607	CES 225	46,880		86461
5/21/2009	CES Environmental - Port Arthur	Sulfidic Caustic	607	CES 237	45,920		86468
5/21/2009	CES Environmental - Port Arthur	Sulfidic Caustic	607	CES 258	46,300		86473
5/26/2009	CES Environmental - Port Arthur	Sulfidic Caustic	607	CES 258	47,720		86643
5/30/2009	CES Environmental - Port Arthur	Sulfidic Caustic	607	CCI 7	2,863,627		
						3,902,162	

MAY SHIPMENTS

SHIP DATE	CONSIGNEE DESTINATION	PRODUCT	FROM TANK	CARRIER TLR/ R/C #	NET WEIGHT
5/5/2009	CES Environmental - Port Arthur	Phenolic Caustic	222	CES 232	42,440
5/8/2009	TRANSFER	CES FUEL	181	to Organo Sulfur Feedstock	218,189
5/1/2009	International Paper	Sulfidic Caustic	607	CES 261	45,820
5/2/2009	CES Environmental - Port Arthur	Sulfidic Caustic	607	CES 261	48,040
5/2/2009	CES Environmental - Port Arthur	Sulfidic Caustic	607	CES 237	46,520
5/2/2009	CES Environmental - Port Arthur	Sulfidic Caustic	607	CES 266	46,400
5/2/2009	CES Environmental - Port Arthur	Sulfidic Caustic	607	CES 267	50,220
5/4/2009	Boise Cascade	Sulfidic Caustic	607	CES 225	47,560
5/4/2009	Boise Cascade	Sulfidic Caustic	607	CES 420	46,240
5/4/2009	CES Environmental - Port Arthur	Sulfidic Caustic	607	CES 269	43,960
5/4/2009	CES Environmental - Port Arthur	Sulfidic Caustic	607	CES 239	46,520
5/5/2009	Boise Cascade	Sulfidic Caustic	607	CES 261	45,900
5/5/2009	CES Environmental - Port Arthur	Sulfidic Caustic	607	CES 420	45,980
5/5/2009	CES Environmental - Port Arthur	Sulfidic Caustic	607	CES 266	46,060
5/5/2009	CES Environmental - Port Arthur	Sulfidic Caustic	607	CES 267	45,060
5/6/2009	Boise Cascade	Sulfidic Caustic	607	CES 261	46,700
5/6/2009	Boise Cascade	Sulfidic Caustic	607	CES 225	47,940
5/6/2009	CES Environmental - Port Arthur	Sulfidic Caustic	607	CES 239	46,180
5/6/2009	CES Environmental - Port Arthur	Sulfidic Caustic	607	CES 269	45,920
5/7/2009	Boise Cascade	Sulfidic Caustic	607	CES 261	46,160
5/7/2009	Boise Cascade	Sulfidic Caustic	607	CES 225	48,460
5/7/2009	CES Environmental - Port Arthur	Sulfidic Caustic	607	CES 237	47,020
5/7/2009	CES Environmental - Port Arthur	Sulfidic Caustic	607	CES 267	47,920
5/8/2009	Boise Cascade	Sulfidic Caustic	607	CES 261	46,020
5/8/2009	Boise Cascade	Sulfidic Caustic	607	CES 225	50,420
5/8/2009	CES Environmental - Port Arthur	Sulfidic Caustic	607	CES 269	48,000
5/8/2009	CES Environmental - Port Arthur	Sulfidic Caustic	607	CES 266	48,400

CES Shipments

5/9/2009	CES Environmental - Port Arthur	Sulfidic Caustic	607	CES 267	49,740
5/9/2009	CES Environmental - Port Arthur	Sulfidic Caustic	607	CES 239	45,780
5/9/2009	CES Environmental - Port Arthur	Sulfidic Caustic	607	CES 225	50,400
5/11/2009	CES Environmental - Port Arthur	Sulfidic Caustic	607	CES 237	47,100
5/11/2009	CES Environmental - Port Arthur	Sulfidic Caustic	607	CES 267	46,360
5/12/2009	CES Environmental - Port Arthur	Sulfidic Caustic	607	CES 239	46,600
5/12/2009	CES Environmental - Port Arthur	Sulfidic Caustic	607	CES 266	47,340
5/12/2009	CES Environmental - Port Arthur	Sulfidic Caustic	607	CES 225	47,520
5/12/2009	CES Environmental - Port Arthur	Sulfidic Caustic	607	CES 269	46,160
5/13/2009	Boise Cascade	Sulfidic Caustic	607	CES 237	45,040
5/13/2009	Boise Cascade	Sulfidic Caustic	607	CES 261	46,980
5/13/2009	CES Environmental - Port Arthur	Sulfidic Caustic	607	CES 258	45,740
5/13/2009	CES Environmental - Port Arthur	Sulfidic Caustic	607	CES 266	46,640
5/13/2009	CES Environmental - Port Arthur	Sulfidic Caustic	607	CES 239	45,140
5/14/2009	CES Environmental - Port Arthur	Sulfidic Caustic	607	CES 237	46,440
5/14/2009	CES Environmental - Port Arthur	Sulfidic Caustic	607	CES 266	44,560
5/15/2009	CES Environmental - Port Arthur	Sulfidic Caustic	607	CES 261	46,280
5/15/2009	CES Environmental - Port Arthur	Sulfidic Caustic	607	CES 225	46,020
5/15/2009	CES Environmental - Port Arthur	Sulfidic Caustic	607	CES 420	45,440
5/20/2009	Boise Cascade	Sulfidic Caustic	607	CES 269	43,220
5/20/2009	Boise Cascade	Sulfidic Caustic	607	CES 261	45,300
5/20/2009	Boise Cascade	Sulfidic Caustic	607	CES 420	43,800
5/20/2009	Boise Cascade	Sulfidic Caustic	607	CES 239	43,140
5/20/2009	Boise Cascade	Sulfidic Caustic	607	CES 262	44,520
5/21/2009	Boise Cascade	Sulfidic Caustic	607	CES 267	46,060
5/21/2009	Boise Cascade	Sulfidic Caustic	607	CES 266	46,040
5/21/2009	Boise Cascade	Sulfidic Caustic	607	CES 237	46,720
5/21/2009	Boise Cascade	Sulfidic Caustic	607	CES 262	47,800
5/22/2009	Boise Cascade	Sulfidic Caustic	607	CES 267	46,240
5/22/2009	Boise Cascade	Sulfidic Caustic	607	CES 261	47,000
5/22/2009	CES Environmental - Port Arthur	Sulfidic Caustic	607	CES 269	44,940
5/22/2009	Boise Cascade	Sulfidic Caustic	607	CES 237	46,020
5/22/2009	CES Environmental - Port Arthur	Sulfidic Caustic	607	CES 267	42,440
5/22/2009	CES Environmental - Port Arthur	Sulfidic Caustic	607	CES 261	43,780

CES Shipments

5/26/2009	Boise Cascade	Sulfidic Caustic	607	CES 266	42,200
5/26/2009	Boise Cascade	Sulfidic Caustic	607	CES 261	43,960
5/26/2009	CES Environmental - Port Arthur	Sulfidic Caustic	607	CES 237	44,620
5/26/2009	CES Environmental - Port Arthur	Sulfidic Caustic	607	CES 261	43,000
5/27/2009	Boise Cascade	Sulfidic Caustic	607	CES 267	45,680
5/27/2009	Boise Cascade	Sulfidic Caustic	607	CES 266	45,380
5/27/2009	CES Environmental - Port Arthur	Sulfidic Caustic	607	CES 267	45,240
5/27/2009	CES Environmental - Port Arthur	Sulfidic Caustic	607	CES 266	45,240
5/28/2009	Boise Cascade	Sulfidic Caustic	607	CES 227	44,640
5/28/2009	Boise Cascade	Sulfidic Caustic	607	CES 269	44,200
5/28/2009	CES Environmental - Port Arthur	Sulfidic Caustic	607	CES 225	44,020
5/28/2009	CES Environmental - Port Arthur	Sulfidic Caustic	607	CES 269	43,800
5/29/2009	Boise Cascade	Sulfidic Caustic	607	CES 261	44,000
5/29/2009	CES Environmental - Port Arthur	Sulfidic Caustic	607	CES 267	43,460
5/29/2009	CES Environmental - Port Arthur	Sulfidic Caustic	607	CES 237	46,480
5/29/2009	CES Environmental - Port Arthur	Sulfidic Caustic	607	CES 261	43,460
5/30/2009	CES Environmental - Port Arthur	Sulfidic Caustic	607	CES 269	40,240
5/30/2009	Boise Cascade	Sulfidic Caustic	607	CES 225	41,440
5/30/2009	CES Environmental - Port Arthur	Sulfidic Caustic	607	CES 420	43,440
5/30/2009	Boise Cascade	Sulfidic Caustic	607	CES 269	41,900
5/30/2009	CES Environmental - Port Arthur	Sulfidic Caustic	607	CES 420	46,460
5/30/2009	CES Environmental - Port Arthur	Sulfidic Caustic	607	CES 420	48,900
5/30/2009	CES Environmental - Port Arthur	Sulfidic Caustic	607	CES 269	40,960
5/30/2009	CES Environmental - Port Arthur	Sulfidic Caustic	607	CES 420	17,420

JUNE

CES Receipts

RECEIPT DATE	RECEIVED FROM	PRODUCT	TO TANK	CARRIER TRLR/ R/C #	NET WEIGHT	PRODUCT TOTAL	BILL OF LADING #
6/1/2009	CES Environmental - Houston	Sulfidic Caustic	607	CES 256	40,920		86840
6/1/2009	CES Environmental - Port Arthur	Sulfidic Caustic	607	CES 267	47,520		86839
6/1/2009	CES Environmental - Houston	Sulfidic Caustic	607	CES 221	46,960		86841
6/2/2009	CES Environmental - Port Arthur	Sulfidic Caustic	607	CES 262	40,900		86953
6/2/2009	CES Environmental - Port Arthur	Sulfidic Caustic	607	CES 268	33,280		86954
6/2/2009	CES Environmental - Port Arthur	Sulfidic Caustic	607	CES 258	43,960		86955
6/2/2009	CES Environmental - Port Arthur	Sulfidic Caustic	607	CES 262	27,940		86956
6/3/2009	CES Environmental - Houston	Sulfidic Caustic	607	CES 249	46,680		86971
6/3/2009	CES Environmental - Port Arthur	Sulfidic Caustic	607	CES 237	45,060		86969
6/4/2009	CES Environmental - Port Arthur	Sulfidic Caustic	607	CES 224	48,580		87035
6/4/2009	CES Environmental - Port Arthur	Sulfidic Caustic	607	CES 268	49,300		87037
6/4/2009	CES Environmental - Port Arthur	Sulfidic Caustic	607	CES 267	37,740		87039
6/4/2009	CES Environmental - Port Arthur	Sulfidic Caustic	607	CES 268	47,160		87041
6/5/2009	CES Environmental - Port Arthur	Sulfidic Caustic	607	CES 224	48,720		87036
6/5/2009	CES Environmental - Port Arthur	Sulfidic Caustic	607	CES 224	34,700		87038
6/5/2009	CES Environmental - Port Arthur	Sulfidic Caustic	607	CES 224	47,560		87040
6/5/2009	CES Environmental - Port Arthur	Sulfidic Caustic	607	CES 224	43,900		87042
6/5/2009	CES Environmental - Port Arthur	Sulfidic Caustic	607	CES 267	47,000		86970
6/8/2009	CES Environmental - Port Arthur	Sulfidic Caustic	607	CES 262	46,340		87314
6/8/2009	CES Environmental - Port Arthur	Sulfidic Caustic	607	CES 237	44,960		87242
6/9/2009	CES Environmental - Port Arthur	Sulfidic Caustic	607	CES 262	46,580		87394
6/9/2009	CES Environmental - Port Arthur	Sulfidic Caustic	607	CES 224	35,640		87395
6/10/2009	CES Environmental - Port Arthur	Sulfidic Caustic	607	CES 267	46,000		87243
6/12/2009	CES Environmental - Port Arthur	Sulfidic Caustic	607	CES 267	46,920		87244
6/25/2009	CES Environmental - Port Arthur	Sulfidic Caustic	607	CES 259	32,720		88151
						1,077,040	

July **CES Receipts**

PRODUCT	TO TANK	CARRIER TRLR/ R/C #	NET WEIGHT	PRODUCT TOTAL	BILL OF LADING #
Hitech Crankcase Additive		GLNX 86180	58,280		
				58,280	
Napthenic Caustic	178	CES 259	43,860		88712
Napthenic Caustic	178	CES 259	43,040		88870
Napthenic Caustic	178	CES 260	45,400		88832
Napthenic Caustic	178	CES 266	45,640		88836
Napthenic Caustic	178	CES 239	45,920		88837
Napthenic Caustic	178	CES 221	46,780		88938
Napthenic Caustic	178	CES 260	38,740		88936
Napthenic Caustic	178	CES 259	47,280		89172
Napthenic Caustic	178	CES 267	50,300		89173
				406,960	
ORGANO SULFUR FEEDSTOCK	166	CES 209	37,000		88442
ORGANO SULFUR FEEDSTOCK	166	CES 227	32,640		88643
ORGANO SULFUR FEEDSTOCK	166	CES 234	46,220		88704
				115,860	

July **CES Shipments**

SHIP DATE	CONSIGNEE DESTINATION	PRODUCT	FROM TANK	CARRIER TLR/ R/C #	NET WEIGHT	PRODUCT TOTAL
7/1/2009	CES Environmental-Houston	Hitech Crankcase	GLNX 86180	CES 228	27,060	
7/1/2009	CES Environmental-Houston	Hitech Crankcase	GLNX 86180	CES 2271	31,220	
						58,280

CES Inventory

PRODUCT	TANK/ RAILCAR #	NET WEIGHT	PRODUCT TOTAL	# per Gal	Gallon
RECOVERED BLACK OIL	T-167	347,981	347,981	7.34	47,409
CES FUEL	T-181	262,620	262,620		
Sulfidic Caustic	T-607	4,106,465	4,106,465	9.46	434,087
Phenolic Caustic	T-222	924,544		9.52	97,116
Phenolic Caustic	T-606	4,208,334	5,132,878	9.52	442,052
ORGANO SULFUR FEEDSTOCK	T-166	389,849		7.70	50,630
ORGANO SULFUR FEEDSTOCK	T-601	484,340	874,189	7.10	68,217
Napthenic Caustic	T-178	406,960	406,960		
LOW FLASH OIL	T-600	634,778	634,778	8.69	73,047
HITECH CRANKCASE ADDITIVE	GLNX 86180		0		

Material Safety Data Sheet

WEAK SULFIDIC CAUSTIC SOLUTION

SECTION 1 – CHEMICAL PRODUCT and COMPANY IDENTIFICATION

1.1	Product Name	Sulfidic Caustic Solution
	Chemical Family	Inorganic Salt Solution
	Synonyms	NA (mixture)
	Formula	NA (mixture)
1.2	Manufacturer	CES Environmental Services, Inc. 4904 Griggs Road Houston, TX 77021 713-676-1460
1.3	Emergency Contact	(b) (6)(b) (6), (b) (6), (b) (7) CHEMTREC 800-424-9300

SECTION 2 – COMPOSITION and INFORMATION ON INGREDIENTS

2.1 Chemical Ingredients (% by wt)

		Typical Analysis
Sodium Sulfide (Na2S)	CAS#: 1313-82-2	2 – 15%
Sodium Hydroxide (NaOH)	CAS#: 1310-73-2	0 – 15%
Sodium Hydrosulfide (NaHS)	CAS# 16721-80-5	0 – 5%
Sodium Carbonate (Na2CO3)	CAS#: 497-19-8	0 – 4%
Water		remaining %

(See Section 8 for exposure guidelines)

SECTION 3 – HAZARDS IDENTIFICATION

NFPA: Health – 3 Flammability – 0 Reactivity – 1

EMERGENCY OVERVIEW

Warning: Solution is highly alkaline.
May evolve small amounts of hydrogen sulfide, a highly toxic gas.
EYE contact will cause marked eye irritation and possible corneal damage.
SKIN contact will result in irritation and possible corrosion of the skin.
INGESTION will irritate and burn the mouth, throat and the gastrointestinal tract; contact with stomach acid will cause hydrogen sulfide vapors to be released.
HEATING or ACID contact will cause hydrogen sulfide gas to evolve.

3.1 POTENTIAL HEALTH EFFECTS

EYE: Contact with the eyes will cause marked eye irritation and possibly severe corneal damage.

SKIN CONTACT: Contact with the skin will cause skin irritation or a burning sensation. Prolonged contact will result in corrosion of the skin.

SKIN ABSORPTION: Absorption is unlikely to occur.

INGESTION: Ingestion will result in severe burning and corrosion of mouth, throat and the gastrointestinal tract. If the ingested material contacts stomach acid, highly toxic hydrogen sulfide gas will be evolved.

INHALATION: Product solution and vapors contain some highly toxic hydrogen sulfide gas. Exposure to this gas causes headaches, nausea, dizziness and vomiting. Continued exposure can lead to loss of consciousness and death.

CHRONIC EFFECTS – CARCINOGENICITY: Not listed as a carcinogen by NTP, IARC or OSHA.

SECTION 4 – FIRST AID MEASURES

4.1 **EYES:** Immediately flush with large quantities of water for 15 minutes. Hold eyelids apart during irrigation to insure thorough flushing of the entire area of the eye. Obtain immediate medication.

4.2 **SKIN:** Immediately flush with large quantities of water. Remove contaminated clothing under a safety shower. Obtain immediate medical attention.

4.3 **INGESTION:** DO NOT INDUCE VOMITING. If victim is conscious, immediately give 2 to 4 glasses of water. if vomiting does occur, repeat fluid administration. Obtain immediate medical attention.

4.4 **INHALATION:** Remove victim form contaminated atmosphere. If breathing is labored, administer oxygen. If breathinghas ceased, clear airway and start mouth to mouth resuscitation. If heart has stopped beating, external heart massage should be applied. Obtain immediate medical attention.

SECTION 5 – FIRE FIGHTING MEASURES

5.1 FLAMMABLE PROPERTIES

FLASH POINT: Not Flammable METHOD USED: NA

5.2 FLAMMABLE LIMITS: Hydrogen Sulfide LFL: 4% UFL: 44%

5.3 EXTINGUISHING MEDIA: Water spray or foam or as appropriate for combustion involved in fire.

5.4 FIRE and EXPLOSIVE HAZARDS: Solution is non-flammable. However if these solutions are exposed to heat or acids, hydrogen sulfide will be released and may form explosive mixtures with air (see above). Keep containers and/or storage vessels in fire area cooled with water spray. Heating may cause the release of hydrogen sulfide vapors.

5.5 FIRE FIGHTING EQUIPMENT: Because of the possible presence of toxic gases and the corrosive nature of the product, wear self-contained breathing apparatus, positive pressure, MSHA / NIOSH (approved or equivalent) and full protective gear.

SECTION 6 – ACCIDENTIAL RELEASE MEASURES

6.1 SMALL RELEASES: Isolate for 75 feet. Confine area to qualified response personnel. Wear proper Personnel Protective equipment (See Section 8). Confine release material by berming or diverting its path Absorb on sand, earth or other inert dry absorbent. Do not allow into sewer, storm drains or any waterway. Oxidize residual reactive sulfides with a weak (3-5%) hydrogen peroxide solution to stop the release of toxic hydrogen sulfide. Remove contaminated soil and dispose of in accordance with all governmental regulations.

6.2 LARGE RELEASES: Activate Emergency Response Plan procedures. Isolate release area for 500 feet. Confine area to qualified response personnel. Wear proper Personnel Protective Equipment (See Section 8). Shut off release, if safe to do so. Dike spill area to prevent runoff into sewers, drains (potential toxic and explosive mixtures of hydrogen sulfide in confined spaces) or surface waterways (potential aquatic toxicity). Recover as much of the solution as possible. Treat remaining material as a small release (See 6.1).

SECTION 7 – HANDLING and STORAGE

7.1 HANDLING: Wear proper protective equipment (See Section 8). Avoid breathing product vapors. Avoid contact with skin and eyes. Use only in a well ventilated area. Dilute product only in enclosed containers. Wash thoroughly after handling.

7.2 STORAGE: Store in well ventilated areas. Do not store combustibles in the area of storage vessels. Keep away from any sources of heat or flame. Store tote and smaller containers out of direct sunlight at moderate temperatures [<80 F (27 C)]. (See Section 10.4 for materials of construction)

SECTION 8 – EXPOSURE CONTROLS and PERSONAL PROTECTION

8.1 RESPIRATORY PROTECTION: Avoid breathing vapors. If TLV is exceeded, then use a full face respirator with organic vapor cartridges.

8.2 SKIN PROTECTION: Neoprene rubber gloves, chemical suit and boots should be worn to prevent contact with the liquid. Wash contaminated clothing prior to reuse. Contaminated leather shoes cannot be cleaned and should be discarded.

8.3 EYE PROTECTION: Chemical goggles and a full face shield.

8.4 EXPOSURE GUIDELINES:

	OSHA		ACGIH	
	TWA	STEL	TLV	STEL
Hydrogen Sulfide	20 ppm (ceiling)		10 ppm (ceiling)	

8.5 ENGINEERING CONTROLS: Use adequate exhaust ventilation to prevent inhalation of product vapors. Where feasible scrub process or storage vessel vapors with caustic solution. Maintain eye wash safety shower in areas where chemical is handled.

SECTION 9 – PHYSICAL and CHEMICAL PROPERTIES

9.1 APPEARANCE: Light to dark brown to green or red liquid.

9.2 ODOR: Hydrocarbon (mercaptan), possibly hydrogen sulfide (rotten egg) odor.

9.3 BOILING POINT: Not Determined

9.4 VAPOR PRESSURE: Not Determined

9.5 VAPOR DENSITY: (Air = 1.0) 1.17

9.6 SOLUBILITY IN WATER: Complete

9.7 SPECIFIC GRAVITY: 1.03 – 1.3 (8.59 – 10.83 lbs/gal)

9.8 pH : 11.5 – 13.5

9.9 VOLATILE: Not Determined

SECTION 10 – STABILITY and REACTIVITY

10.1 STABILITY: This is a stable material.

10.2 HAZARDOUS POLYMERIZATION: Will not occur.

10.3 HAZARDOUS DECOMPOSITION PRODUCTS: Heating product will evolve H2S gas. fire conditions will cause the production of sulfur dioxide. Hydrogen sulfide (4 – 44%) may form flammable mixtures with air.

10.4 INCOMPATIBILITY: Acids will cause the release of highly toxic hydrogen sulfide. Sulfidic caustic solution is not compatible with copper, zinc, aluminum or their alloys (i.e. bronze, brass, galvanized metals, etc.). Corrosive to steel above 150 F (65.5 C). These materials of

SECTION 10 – STABILITY and REACTIVITY (Continued)

construction should not be used in handling systems or storage containers for this product. (See Section 7.2 Storage)

SECTION 11 – TOXICOLOGICAL INFORMATION

11.1 ORAL: Data not available.

11.2 DERMAL: Data not available.

11.3 INHALATION: INH-RAT LC 50: 444 ppm (hydrogen sulfide)

11.4 CHRONIC and CARCINOGENICITY: No evidence available.

11.5 TERATOLOGY: Data not available.

11.6 REPRODUCTION: Data not available.

11.7 MUTAGENICITY: Data not available.

SECTION 12 – ECOLOGICAL INFORMATION

None Available

SECTION 13 – DISPOSAL CONSIDERATIONS

If released to the environment for other than its intended purpose, this product contains some reactive sulfides but not a sufficient quantity to meet the definition of a D003, hazardous waste. The pH may be high enough to meet the definition of a corrosive waste, D002.

SECTION 14 – TRANSPORT INFORMATION

14.1 DOT SHIPPING NAME: Corrosive liquids, n.o.s.

14.2 DOT HAZARD CLASS: 8

14.3 UN/NA NUMBER: UN1760

14.4 PACKING GROUP: II

14.5 DOT PLACARD: Corrosive

14.6 DOT LABLE(s): Corrosive

14.7 IMO SHIPPING NAME: Sodium Hydroxide Solution

14.8 RQ (REPORTABLE QUANTITY): 1,000 lbs (454 Kg) 100% basis (Approx. 538 gals)

14.9 USCG BARGE CERTIFICATION: SSH (sodium sulfide, hydrosulfide solutions, H2S 15 ppm or less). SSI (sodium sulfide, hydrosulfide solutions, H2S greater than 15 ppm but less than 200 ppm).

SECTION 15 – REGULATORY INFORMATION

15.1 OSHA: This product is listed as a hazardous material under criteria of the Federal OSHA Hazard Communication Standard, 29 CFR 1910.1200.

15.2 SARA TITLE III. a. EHS (Extremely Hazardous Substance) List:

b. Sections 311 and 312 (Tier I, II) Categories:

Immediate (acute)	Yes
Fire	No
Sudden Release	No
Reactivity	Yes
Delayed (chronic)	No

c. Section 313 (Toxic Release Report-Form R): No

d. TPQ (Threshold Planning Quantity): No

15.3 CERCLA and SUPERFUND: RQ (Reportable Quantity) 1,000 lbs

15.4 TSCA (Toxic Substance Control Act) Inventory List: Yes

15.5 RCRA (Resource Conservation and Recovery Act) Status: Yes

15.6 WHMIS (Canada) Hazard Classification: E, D1

15.7 DOT HAZARDOUS MATERIAL: (See Section 14) Yes

15.8 CAA HAZARDOUS AIR POLLUTANT (HAP): No

SECTION 16 – OTHER INFORMATION

REVISIONS: The entire MSDS was reformatted to comply to ANSI Standard Z400.1-1993.

Material Safety Data Sheet

May be used to comply with OSHA's Hazard Communication Standard
29CFR 1910 1200. Standard must be consulted for specific requirements.

QUICK IDENTIFIER
Common Name: **CES Recovered Oil (Grade II)**

SECTION 1 – MANUFACTURER'S NAME

Manufacturer's Name:	CES Environmental Services, Inc.		
Address:	4904 Griggs Road	Emergency Telephone No.	(b) (6), (b) (7)
City, State, and Zip:	Houston, Texas 77021	Other Information Call:	(b) (6), (b) (7)
Signature of Person Responsible for Preparation (optional):	(b) (6), (b)	Date Prepared:	1/15/07

SECTION 2 – HAZARDOUS INGREDIENTS/IDENTITY

Hazardous Component(s) Chemical & Common Name(s):	OSHA PEL	ACGIH TLV	Other Exposure Limits	% (optional)	CAS No.
Recycled, Dewatered Petroleum Oils	5mg/M^3	5mg/M^3			68476-33-5
Contains:					
Aliphatic and Aromatic Petroleum Hydrocarbons **				99%	
Halogens				<1000 ppm	
Polynuclear Aromatic Hydrocarbons				<0.01%	
Water and Sediment				<3.0%	
Ash				<0.75%	

* 5mg/M^3 ACGIH TLV and OSHA PEL for mineral oil mists.

** Including but not limited to used motor oil and used industrial oils.

SECTION 3 – PHYSICAL & CHEMICAL CHARACTERISTICS

Boiling Point:	450^{0}F	Specific Gravity: (H_20 ml)	0.87-0.91	Vapor Pressure: (mm Hg)	0.4
		Vapor Density (Air = 1)	Unavailable		
Solubility In Water:	Nil	Reactivity in Water:	None		
Appearance And Color:	Dark color w/petroleum odor	Melting Point:	Not applicable		

Flash Point (PMCC): >140^{0}F		Sodium:	<50.0 ppm
Arsenic:	<2.0 ppm	Aluminum:	<15.0 ppm
Cadmium	<1.0 ppm	Chromium	<2.0 ppm
Vanadium	<1.0 ppm	Lead	<100.0 ppm
Sulfur	<0.4%	PCB	<2.0 ppm

All product is filtered through 400 micron filters.
Saybolt Viscosity: 140^{0}F 88-105 SUS

Typical Btu 17,000/lb and higher

Material Safety Data Sheet

May be used to comply with OSHA's Hazard Communication Standard
29CFR 1910 1200. Standard must be consulted for specific requirements.

QUICK IDENTIFIER
Common Name: **CES Recovered Oil (Grade II)**

SECTION 4 – FIRE & EXPLOSION DATA

Flash Point: Min 140 F | Method Used: Close Cup | Flammable Limits in Air % by Volume | LEL Lower: Unknown | UEL Upper: Unknown

Auto – Ignition Temperature: N/A | Extinguisher: Carbon Dioxide/Foam/Dry Chemical/Water Mist

Special Fire Fighting Procedures: Self-contained breathing apparatus to protect against the hazardous effects of combustible products and oxygen deficiencies.

Unusual Fire and Explosion Hazards: **NFPA Class: Combustible Liquid II**
When heated above its flashpoint, this material will release vapors which can burn or be explosive in confined spaces if exposed to a source of ignition.

SECTION 5 – PHYSICAL HAZARDS (REACTIVITY DATA)

Stability: Unstable ☐ Stable ☒ | Conditions to Avoid: Stable

Incompatibility (materials to avoid): Strong Oxidizing Agents

Hazardous Decomposition Products: Carbon Monoxide, Carbon Dioxide, Hydrogen Chloride, and Sulfur Dioxide

Hazardous Polymerization: May Occur ☐ Will Not Occur ☒ | Conditions to Avoid: Incomplete combustion may form carbon monoxide.

SECTION 6 – HEALTH HAZARDS

1. Acute
May cause eye and skin irritation.

Signs and Symptoms of Exposure: Skin: Irritation/Dermatitis.
Eyes: Irritation, Redness, and Tearing

Medical Conditions Generally Aggravated by Exposure: Skin Irritation/Dermatitis

2. Chronic:
In a laboratory study, mice developed skin cancer after their skin was exposed to used motor oil twice a week without being washed off for most of their life span. While this one study is not conclusive, substances found to cause cancer in laboratory animals may also cause cancer in humans.

Chemical Listed as Carcinogen or Potential Carcinogen: N/A | National Toxicologic Program: Yes ☐ No ☒ | I.A.R.C Monographs: Yes ☐ No ☒ | OSHA: Yes ☐ No ☒

Emergency and First Aid Procedures: EYES: Flush eyes with plenty of water for several minutes. Get medical attention if irritation persists.

SKIN: Wash with plenty of soap and water. Get medical attention if irritation persists.

INGESTION: Do not induce vomiting. Get medical attention.

INHALATION: If irritation, headache, nausea or drowsiness occurs, move to fresh air. Get medical attention if breathing becomes difficult or irritation persists.

	1. Irritation:	Not expected to be a problem unless oil mists are generated.
ROUTES OF ENTRY	2. Eyes:	Mild irritant. Use splash protection goggles.
	3. Sun:	Mild irritant. Use gloves and protection.
	4. Ingestion:	Low toxicity. Do not take internally.

SECTION 7 – SPECIAL PRECAUTIONS AND SPILL/LEAK PROCEDURES

Precautions to be Taken at Handling and Storage: Use skin protection, gloves, and eye protection.

Other Precautions: Do not use welding or cutting torch on or near container or storage vessel.

Steps to be taken in case material is released or spilled: Contain spill using oil absorbents (granular, pads, booms). Remove flame sources.

Waste Disposal Methods (consult Federal, State, and Local Regulations): Follow Federal and State disposal regulations.

SECTION 8 – SPECIAL PROTECTION INFORMATION/CONTROL MEASURES

Respiratory Protection (specify type): Not required under normal conditions of use. If oil mists are generated above 5 mg/m^3, then a NIOSH/MSHA approved respirator is advised in the absence of proper environmental controls.

Ventilation: Not required under normal conditions of use. | Local Exhaust N/A | Mechanical (general) | Special Below TLV's N/A | Other N/A

Protective Gloves: Neoprene or rubber

Eye Protection: Safety glasses or goggles

Other Protective Clothing or Equipment: Impervious clothing and boots

Work/Hygienic Practices: Do not take internally; avoid skin contact; wash hands thoroughly; and do not get in eyes.

Material Safety Data Sheet

May be used to comply with OSHA's Hazard Communication Standard 29CFR 1910 1200. Standard must be consulted for specific requirements.

QUICK IDENTIFIER
Common Name: **CES Low Flash Recovered Black Oil**

SECTION 1 – MANUFACTURER'S NAME

Manufacturer's Name:	CES Environmental Services, Inc.		
Address:	4904 Griggs Road	Emergency Telephone No.	(b) (6), (b) (7)
City, State, and Zip:	Houston, Texas 77021	Other Information Call:	(b) (6), (b) (7)
Signature of Person Responsible for Preparation (optional):	(b) (6), (b)	Date Prepared:	1/15/07

SECTION 2 – HAZARDOUS INGREDIENTS/IDENTITY

Hazardous Component(s) Chemical & Common Name(s):	OSHA PEL	ACGIH TLV	Other Exposure Limits	% (optional)	CAS No.
Recycled, Dewatered Petroleum Oils	5mg/M^3	5mg/M^3			68476-33-5
Contains:					
Aliphatic and Aromatic Petroleum Hydrocarbons **				99%	
Halogens				<1000 ppm	
Polynuclear Aromatic Hydrocarbons				<0.01%	
Water and Sediment				<3.0%	
Ash				<0.75%	

* 5mg/M^3 ACGIH TLV and OSHA PEL for mineral oil mists.

** Including but not limited to used motor oil and used industrial oils.

SECTION 3 – PHYSICAL & CHEMICAL CHARACTERISTICS

Boiling Point:	450^{0}F	Specific Gravity: (H_20 ml)	0.87-0.91	Vapor Pressure: (mm Hg)	0.4
		Vapor Density (Air = 1)	Unavailable		
Solubility In Water:	Nil	Reactivity in Water:	None		
Appearance And Color:	Dark color w/petroleum odor	Melting Point:	Not applicable		

Flash Point (PMCC):	<140^{0}F	Sodium:	<50.0 ppm
Arsenic:	<2.0 ppm	Aluminum:	<15.0 ppm
Cadmium	<1.0 ppm	Chromium	<2.0 ppm
Vanadium	<1.0 ppm	Lead	<100.0 ppm
Sulfur	<0.4%	PCB	<2.0 ppm

All product is filtered through 400 micron filters.
Saybolt Viscosity: 140^{0}F 88-105 SUS

Typical Btu 17,000/lb and higher

Material Safety Data Sheet

May be used to comply with OSHA's Hazard Communication Standard
29CFR 1910 1200. Standard must be consulted for specific requirements.

QUICK IDENTIFIER
Common Name: **CES Low Flash Recovered Black Oil**

SECTION 4 – FIRE & EXPLOSION DATA

Flash Point: Min <140 F | Method Used: Close Cup | Flammable Limits in Air % by Volume: LEL Lower Unknown, UEL Upper Unknown

Auto – Ignition Temperature: N/A | Extinguisher: Carbon Dioxide/Foam/Dry Chemical/Water Mist

Special Fire Fighting Procedures: Self-contained breathing apparatus to protect against the hazardous effects of combustible products and oxygen deficiencies.

Unusual Fire and Explosion Hazards: **NFPA Class: Combustible Liquid II**
When heated above its flashpoint, this material will release vapors which can burn or be explosive in confined spaces if exposed to a source of ignition.

SECTION 5 – PHYSICAL HAZARDS (REACTIVITY DATA)

Stability: Unstable ☐ Stable ☒ | Conditions to Avoid: Stable

Incompatibility (materials to avoid): Strong Oxidizing Agents

Hazardous Decomposition Products: Carbon Monoxide, Carbon Dioxide, Hydrogen Chloride, and Sulfur Dioxide

Hazardous Polymerization: May Occur ☐ Will Not Occur ☒ | Conditions to Avoid: Incomplete combustion may form carbon monoxide.

SECTION 6 – HEALTH HAZARDS

1. Acute:
May cause eye and skin irritation.

Signs and Symptoms of Exposure: Skin: Irritation/Dermatitis.
Eyes: Irritation, Redness, and Tearing

Medical Conditions Generally Aggravated by Exposure: Skin Irritation/Dermatitis

2. Chronic:
In a laboratory study, mice developed skin cancer after their skin was exposed to used motor oil twice a week without being washed off for most of their life span. While this one study is not conclusive, substances found to cause cancer in laboratory animals may also cause cancer in humans.

Chemical Listed as Carcinogen or Potential Carcinogen: N/A	National Toxicologic Program:	Yes ☐ No ☒	I.A.R.C Monographs	Yes ☐ No ☒	OSHA:	Yes ☐ No ☒

Emergency and First Aid Procedures: EYES: Flush eyes with plenty of water for several minutes. Get medical attention if irritation persists.

SKIN: Wash with plenty of soap and water. Get medical attention if irritation persists.

INGESTION: Do not induce vomiting. Get medical attention.

INHALATION: If irritation, headache, nausea or drowsiness occurs, move to fresh air. Get medical attention if breathing becomes difficult or irritation persists.

ROUTES OF ENTRY	1. Irritation:	Not expected to be a problem unless oil mists are generated.
	2. Eyes:	Mild irritant. Use splash protection goggles.
	3. Sun:	Mild irritant. Use gloves and protection.
	4. Ingestion:	Low toxicity. Do not take internally.

SECTION 7 – SPECIAL PRECAUTIONS AND SPILL/LEAK PROCEDURES

Precautions to be Taken at Handling and Storage: Use skin protection, gloves, and eye protection.

Other Precautions: Do not use welding or cutting torch on or near container or storage vessel.

Steps to be taken in case material is released or spilled: Contain spill using oil absorbents (granular, pads, booms). Remove flame sources.

Waste Disposal Methods (consult Federal, State, and Local Regulations): Follow Federal and State disposal regulations.

SECTION 8 – SPECIAL PROTECTION INFORMATION/CONTROL MEASURES

Respiratory Protection (specify type): Not required under normal conditions of use. If oil mists are generated above 5 mg/m^3, then a NIOSH/MSHA approved respirator is advised in the absence of proper environmental controls.

Ventilation: Not required under normal conditions of use. | Local Exhaust N/A | Mechanical (general) Below TLV's | Special N/A | Other N/A

Protective Gloves: Neoprene or rubber

Eye Protection: Safety glasses or goggles

Other Protective Clothing or Equipment: Impervious clothing and boots

Work/Hygienic Practices: Do not take internally; avoid skin contact; wash hands thoroughly; and do not get in eyes.

CES Environmental Services, Inc.

Sodium Hydrosulfide Solution

Material Safety Data Sheet

1. Company and Product Identification

1.1 Product Name: CES Sodium Hydrosulfide Solution

Synonyms: Sodium Hydrogen Sulfide Solution, Sodium Bisulfide Solution, Sodium Sulfhydrate Solution

CAS Number: 16721-80-5

1.2 Recommended Uses:

1.3 Supplier:

CES Environmental Services, Inc.
4904 Griggs Road
Houston, TX 77021

1.4 Emergency Contact: (b) (6), (b) (7)(C) [redacted]

CHEMTREC 800-424-9300

2. Composition and Information on Ingredients

2.1 Chemical Ingredients (% by wt)

COMPONENT	CAS #	EXPOSURE LIMITS	% BY WT
Sodium Hydrosulfide	16721-80-5	No ACGIH TLV or OSHA PEL established for Sodium Hydrosulfide.	5 – 20%
Sodium Sulfide			0 – 10%
Sodium Hydroxide			0 – 10%
Water	7732-18-5		95 – 60%

3. Hazards Identification

Emergency Overview:

DANGER! CAUSES SEVERE BURNS TO EYES, DIGESTIVE TRACT, AND SKIN. THIS IS A HIGHLY ALKALINE LIQUID. HARMFUL IF SWALLOWED. HARMFUL IF MIST IS INHALED. Do not taste or swallow. Avoid Skin Contact. Use only with adequate ventilation. Wash thoroughly after handling. CONTACT WITH ACID RELEASES POISONOUS AND FLAMMABLE HYDROGEN SULFIDE GAS.

POTENTIAL HEALTH EFFECTS: Chemical burns result from contact with liquid or mist. Hydrogen sulfide gas exposure causes eye irritation, headache, and dizziness. Acute exposure to hydrogensulfide gas causes unconsciousness and paralysis of breathing muscles leading to death.

3.1 Route of Entry:
- Inhalation
- Skin Absorption
- Ingestion

3.2 Human Effects:
High alkalinity makes this product corrosive to mucous membranes – chemical burns result from contact. Mists and vapors cause irritation to the conjunctiva and cornea of the eye.

3.3. Acute Inhalation:

Severe respiratory distress because of corrosivity. Hydrogen sulfide gas, produced if this product contacts acid, causes confusion, weakness of the extremities, unconsciousness, pulmonary edema, asphyxiation and central respiratory paralysis leading to death.

Chronic Inhalation:
Extreme irritation to respiratory passages.

3.4 Acute Skin Contact:
Painful chemical burns. Systemic poisoning by sulfide causes headache, nausea, dizziness, confusion, weakness of the extremities, and possible unconsciousness.

Chronic Skin Contact:
Extreme irritation to skin.

3.5 Acute Eye Contact:
Alkali burns to conjunctiva and cornea with possible irreversible destruction of tissue.

Chronic Eye Contact:
Extreme irritation to the eyes caused by vapor or mist; corneal opacity.

3. Hazards Identification (CONTINUED)

3.6 Acute Ingestion:
Destruction of the lining of the esophagus and stomach. Rapid breathing, confusion, unconsciousness, paralysis of respiratory muscles leading to death.

Chronic Ingestion:
Headache, nausea, dizziness, confusion, and painful alkali burns to the esophagus.

3.7 Carcinogenicity:
- NTP – Not Listed
- IARC – Not Listed
- OSHA – Not Regulated

3.8 Medical Conditions Aggravated by Exposure:
- None are known.

4. First Aid Measures

If swallowed, do not induce vomiting unless directed to do so by medical personnel. Have victim drink as much milk or water as possible. Never give anything by mouth to an unconscious person.

If mist is inhaled, remove to fresh air. Get medical attention immediately and contact a poison control center.

For eye contact, flush eyes with large amounts of water for at least 15 minutes and get IMMEDIATE medical attention. For skin contact, wash with soap and water. Wash clothing before reuse.

PHYSICIAN:
Contact causes caustic burns. Treat ingestion as hydrogen sulfide gas poisoning in addition to caustic burns.

5. Fire Fighting Measures

5.1 Flash Point:
- Non-flammable

5.2 Flammability Limits:
Hydrogen sulfide can collect in confined spaces above the liquid. It forms flammable mixtures with air from about 4% vapor up to about 45%.

5.3 Auto-ignition Temperature:
- Not Applicable

5. Fire Fighting Measures (CONTINUED)

5.4 General Hazard:
Poison, flammable hydrogen sulfide gas will be evolved from this product on exposure to acid or excessive heat.

5.5 Fire Fighting Procedures:
Firefighters should wear self-contained breathing apparatus. Do not use carbon dioxide fire extinguishers because toxic hydrogen sulfide gas will be liberated from this product.

5.6 Fire Fighting Equipment:
Use water in flooding quantities. A heavy fog of water may be effective in knocking down vapors.

5.7 Hazardous Combustion Products:
Poisonous sulfur dioxide gas will be generated if the vapors from this product burn.

6. Accidental Release Measures

6.1 General:
Avoid generating mist and keep this product away from acids. Use appropriate Personnel Protective Equipment (PPE). Spilled product is a RCRA hazardous waste.

6.2 Small Spill:
Absorb in dirt, sawdust, fly ash or other inert absorbant. Scoop up and store in sealed containers. Dispose of in accordance with local, state, or federal regulations.

6.3 Large Spill:
Dike to prevent entry into sewers or drains. Recover as much of the solution as possible. Mix solution with dilute excess hydrogen peroxide to oxidize sulfide and eliminate danger of hydrogen sulfide evolution.

7. Handling and Storage

7.1 Storage Temperature: Not Critical

7.2 Storage Pressure: Atmospheric

7.3 General:
Put a vapor trap or scrubber on tank vent.

- Poison hydrogen sulfide gas will be present in the vapor space above sodium hydrosulfide solution. Do not enter tanks or other vessels that have contained this product unless fresh air breathing apparatus is used.
- Do not store in contact with copper, zinc or aluminum.
- Preferred material of construction for storage tanks is stainless steel; however, carbon steel is acceptable.

8. Exposure Controls and Personal Protection

8.1 Engineering Controls:
Adequate ventilation is required to remove the toxic and flammable vapors or mist which may be present. Safety shower sand eyewash fountain should always be available in the work area.

8.2 Respiratory Protection:

Use self-contained breathing apparatus or supplied-air respirator if the PEL for hydrogen sulfide might be exceeded.

8.3 Skin Protection:
Rubber suits and boots as needed for protection from splashing.

8.4 Eye Protection:
Chemical safety goggles and safety shield for protection from splashing.

9. Physical and Chemical Properties

9.1 Physical State:	Liquid
9.2 Vapor Pressure:	Not Applicable
9.3 Specific Gravity:	About 1.18
9.4 Solubility in Water:	Complete
9.5 pH	Highly Alkaline
9.6 Boiling Point:	About 107 Deg. C. (225 Deg. F.)
9.7 Melting Point:	About -18 Deg. C. (0 Deg. F.)
9.8 vapor Density:	Not Applicable
9.9 Evaporation Rate:	Not Applicable
9.10 Odor:	"Rotten Egg" Odor
9.11 Appearance:	Yellow to Amber Liquid

10. Stability and Reactivity

10.1 Chemical Stability:

Mixing with acids liberates poisonous hydrogen sulfide. Mixing with strong oxidizers causes a violent reaction. Mixing with strong alkalies may form solid, hydrated sodium sulfide.

10.2 Incompatibility:
Acids, strong oxidizers, and strong alkalies.

10.3 Hazardous Decomposition Products:
Very high temperatures will decompose this product to form poisonous hydrogen sulfide gas.

10.4 Hazardous Polymerization: Does Not Occur

11. Toxicological Information

11.1 Eye:
Corrosive due to product's alkalinity

11.2 Skin:
Corrosive to skin due to product's alkalinity. May be toxic when absorbed through skin.

11.3 Ingestion:
TOXIC – Human Oral LD_{LO} reported to be 50 mg/kg for Na_2S. Equivalent to 163 mg/kg for this product (based on sulfur content).

11.4 Inhalation:
TOXIC – Hydrogen sulfide inhalation is assumed. Human LC_{LO} is 600 ppm for 30 minutes for hydrogen sulfide; equivalent to 4500 ppm of respirable mist from this product.

11.5 Sub-chronic:
Irritation to the conjunctiva and cornea of the eye from vapors.

11.6 Chronic/Carcinogenic:
Not a known carcinogen. Chronic acute exposures to vapors may cause neurologic deficits like those in survivors of other severe asphixiant poisonings.

11.7 Teratogenic: Not Known

11.8 **Reproductive:** Not Known

11.9 **Mutagenic:** Not Known

12. Ecological Information

12.1 Toxicity:
Toxic to aquatic organisms. Sulfide ion reacts with oxygen; waters containing sulfide ion will not contain dissolved oxygen.

12.2 Distribution:
All components of this product are found naturally in all ecosystems.

12.3 Chemical Fate:
With dilution, the sulfide will be readily incorporated into the preexisting natural sulfur cycle.

13. Disposal Considerations

3.1 Waste Treatment:
Waste containing sulfide may be hazardous and may require disposal in an approved hazardous waste landfill. Sulfide can be oxidized with dilute hydrogen peroxide or any other oxidizing agent to non-hazardous sulfate; care should be taken ad the reaction may be violent.

14. Transportation Information

D.O.T. Shipping Name:	Corrosive liquids, toxic, n.o.s.
Technical Shipping Name:	Sodium Hydrosulfide Solution
D.O.T. Hazard Class:	8 – CORROSIVE, PGII
U.N./N.A. Number:	UN 2922
Product R.Q. (lbs):	5,000 lbs of Sodium Hydrosulfide; 23,000 lbs of this product
D.O.T. Label:	CORROSIVE
D.O.T. Placard:	CORROSIVE

Freight Class Bulk:	Inorganic Chemical
Freight Class Package:	Inorganic Chemical
Product Label:	Sodium Hydrosulfide Solution

15. Regulatory Information

OSHA Status:
This product is hazardous under the criteria of the Federal OSHA Hazard Communication Standard, 29 CFR 1910.1200. It is classified as toxic based on ingestion information and corrosive based on its alkalinity.

TSCA Status:
Listed on TSCA Inventory

CERCLA Reportable Quantity:
5,000 lbs of Sodium Hydrosulfide 23,000 lbs of this product.

SARA Title III.
Section 302, Extremely Hazardous Substances: NONE
Section 311/312, Hazard Categories: Category 1 (Acute Hazard)
Section 313, Toxics Release Inventory: NONE

RCRA Status:
If discarded in its purchased form, this product could be a hazardous waste because of its alkalinity and/or sulfide content. Under RCRA, it is the responsibility of the product user to determine at the time of disposal whether a material containing or derived from this product should be classified as a hazardous waste under 40 CFR 261.20-24.

16. Other Information

16.1 Ratings:

NFPA Rating: (National Fire Protection Association):

Health = 3
(Materials which on short exposure could cause serious temporary or residual injury.)

Fire = 1
(Materials which will burn in air when exposed to a temperature of 1500 Deg. F.)

Reactivity = 1
(Materials which are normally stable but which can become unstable at elevated temperature and pressure.)

Special = NA

16. Other Information (CONTINUED)

Prepared By: CES Environmental Services, Inc. Technical Dept.

Date: July 23, 2008

Material Safety Data Sheet

PHENOLIC CAUSTIC SOLUTION

SECTION 1 – CHEMICAL PRODUCT and COMPANY IDENTIFICATION

1.1	Product Name	Phenolic Caustic Solution
	Chemical Family	Inorganic Salt Solution
	Synonyms	NA (mixture)
	Formula	NA (mixture)
1.2	Manufacturer	CES Environmental Services, Inc. 4904 Griggs Road Houston, TX 77021 713-676-1460
1.3	Emergency Contact	(b) (6), (b) (7)(C) CHEMTREC 800-424-9300

SECTION 2 – COMPOSITION and INFORMATION ON INGREDIENTS

2.1 Chemical Ingredients (% by wt)

	Typical Analysis	
Sodium Sulfide (Na2S)	CAS#: 1313-82-2	2 – 15%
Sodium Hydroxide (NaOH)	CAS#: 1310-73-2	0 – 15%
Sodium Hydrosulfide (NaHS)	CAS# 16721-80-5	0 – 5%
Sodium Carbonate (Na2CO3)	CAS#: 497-19-8	0 – 4%
Organic Phenolic Compond	CAS#: NA	1 – 24%
Water		remaining %

(See Section 8 for exposure guidelines)

SECTION 3 – HAZARDS IDENTIFICATION

NFPA: Health – 3 Flammability – 0 Reactivity – 1

EMERGENCY OVERVIEW

Warning: Solution is highly alkaline.
May evolve small amounts of hydrogen sulfide, a highly toxic gas.
EYE contact will cause marked eye irritation and possible corneal damage.
SKIN contact will result in irritation and possible corrosion of the skin.
INGESTION will irritate and burn the mouth, throat and the gastrointestinal tract; contact with stomach acid will cause hydrogen sulfide vapors to be released.
HEATING or ACID contact will cause hydrogen sulfide gas to evolve.

3.1 POTENTIAL HEALTH EFFECTS

EYE: Contact with the eyes will cause marked eye irritation and possibly severe corneal damage.

SKIN CONTACT: Contact with the skin will cause skin irritation or a burning sensation. Prolonged contact will result in corrosion of the skin.

SKIN ABSORPTION: Absorption is unlikely to occur.

INGESTION: Ingestion will result in severe burning and corrosion of mouth, throat and the gastrointestinal tract. If the ingested material contacts stomach acid, highly toxic hydrogen sulfide gas will be evolved.

INHALATION: Product solution and vapors contain some highly toxic hydrogen sulfide gas. Exposure to this gas causes headaches, nausea, dizziness and vomiting. Continued exposure can lead to loss of consciousness and death.

CHRONIC EFFECTS – CARCINOGENICITY: Not listed as a carcinogen by NTP, IARC or OSHA.

SECTION 4 – FIRST AID MEASURES

4.1 **EYES:** Immediately flush with large quantities of water for 15 minutes. Hold eyelids apart during irrigation to insure thorough flushing of the entire area of the eye. Obtain immediate medication.

4.2 **SKIN:** Immediately flush with large quantities of water. Remove contaminated clothing under a safety shower. Obtain immediate medical attention.

4.3 **INGESTION:** DO NOT INDUCE VOMITING. If victim is conscious, immediately give 2 to 4 glasses of water. if vomiting does occur, repeat fluid administration. Obtain immediate medical attention.

4.4 **INHALATION:** Remove victim form contaminated atmosphere. If breathing is labored, administer oxygen. If breathinghas ceased, clear airway and start mouth to mouth resuscitation. If heart has stopped beating, external heart massage should be applied. Obtain immediate medical attention.

SECTION 5 – FIRE FIGHTING MEASURES

5.1 FLAMMABLE PROPERTIES

FLASH POINT: Not Flammable METHOD USED: NA

5.2 FLAMMABLE LIMITS: Hydrogen Sulfide LFL: 4% UFL: 44%

5.3 EXTINGUISHING MEDIA: Water spray or foam or as appropriate for combustion involved in fire.

5.4 FIRE and EXPLOSIVE HAZARDS: Solution is non-flammable. However if these solutions are exposed to heat or acids, hydrogen sulfide will be released and may form explosive mixtures with air (see above). Keep containers and/or storage vessels in fire area cooled with water spray. Heating may cause the release of hydrogen sulfide vapors.

5.5 FIRE FIGHTING EQUIPMENT: Because of the possible presence of toxic gases and the corrosive nature of the product, wear self-contained breathing apparatus, positive pressure, MSHA / NIOSH (approved or equivalent) and full protective gear.

SECTION 6 – ACCIDENTIAL RELEASE MEASURES

6.1 SMALL RELEASES: Isolate for 75 feet. Confine area to qualified response personnel. Wear proper Personnel Protective equipment (See Section 8). Confine release material by berming or diverting its path Absorb on sand, earth or other inert dry absorbent. Do not allow into sewer, storm drains or any waterway. Oxidize residual reactive sulfides with a weak (3-5%) hydrogen peroxide solution to stop the release of toxic hydrogen sulfide. Remove contaminated soil and dispose of in accordance with all governmental regulations.

6.2 LARGE RELEASES: Activate Emergency Response Plan procedures. Isolate release area for 500 feet. Confine area to qualified response personnel. Wear proper Personnel Protective Equipment (See Section 8). Shut off release, if safe to do so. Dike spill area to prevent runoff into sewers, drains (potential toxic and explosive mixtures of hydrogen sulfide in confined spaces) or surface waterways (potential aquatic toxicity). Recover as much of the solution as possible. Treat remaining material as a small release (See 6.1).

SECTION 7 – HANDLING and STORAGE

7.1 HANDLING: Wear proper protective equipment (See Section 8). Avoid breathing product vapors. Avoid contact with skin and eyes. Use only in a well ventilated area. Dilute product only in enclosed containers. Wash thoroughly after handling.

7.2 STORAGE: Store in well ventilated areas. Do not store combustibles in the area of storage vessels. Keep away from any sources of heat or flame. Store tote and smaller containers out of direct sunlight at moderate temperatures [<80 F (27 C)]. (See Section 10.4 for materials of construction)

SECTION 8 – EXPOSURE CONTROLS and PERSONAL PROTECTION

8.1 RESPIRATORY PROTECTION: If working near open container or storage vessel opening or open tank truck dome cover, wear self-contained breathing apparatus, positive pressure, MSHA / NIOSH (approved or equivalent).

8.2 SKIN PROTECTION: Neoprene rubber gloves, chemical suit and boots should be worn to prevent contact with the liquid. Wash contaminated clothing prior to reuse. Contaminated leather shoes cannot be cleaned and should be discarded.

8.3 EYE PROTECTION: Chemical goggles and a full face shield.

8.4 EXPOSURE GUIDELINES:

	OSHA		ACGIH	
	TWA	STEL	TLV	STEL
Hydrogen Sulfide	20 ppm (ceiling)		10 ppm (ceiling)	

8.5 ENGINEERING CONTROLS: Use adequate exhaust ventilation to prevent inhalation of product vapors. Where feasible scrub process or storage vessel vapors with caustic solution. Maintain eye wash safety shower in areas where chemical is handled.

SECTION 9 – PHYSICAL and CHEMICAL PROPERTIES

9.1 APPEARANCE: Light to dark brown to green or red liquid.

9.2 ODOR: Hydrocarbon (mercaptan), possibly hydrogen sulfide (rotten egg) odor.

9.3 BOILING POINT: Not Determined

9.4 VAPOR PRESSURE: Not Determined

9.5 VAPOR DENSITY: (Air = 1.0) 1.17

9.6 SOLUBILITY IN WATER: Complete

9.7 SPECIFIC GRAVITY: 1.03 – 1.3 (8.59 – 10.83 lbs/gal)

9.8 pH : 11.5 – 13.5

9.9 VOLATILE: Not Determined

SECTION 10 – STABILITY and REACTIVITY

10.1 STABILITY: This is a stable material.

10.2 HAZARDOUS POLYMERIZATION: Will not occur.

10.3 HAZARDOUS DECOMPOSITION PRODUCTS: Heating product will evolve H2S gas. fire conditions will cause the production of sulfur dioxide. Hydrogen sulfide (4 – 44%) may form flammable mixtures with air.

10.4 INCOMPATIBILITY: Acids will cause the release of highly toxic hydrogen sulfide. Sulfidic caustic solution is not compatible with copper, zinc, aluminum or their alloys (i.e. bronze, brass, galvanized metals, etc.). Corrosive to steel above 150 F (65.5 C). These materials of

SECTION 10 – STABILITY and REACTIVITY (Continued)

construction should not be used in handling systems or storage containers for this product. (See Section 7.2 Storage)

SECTION 11 – TOXICOLOGICAL INFORMATION

11.1 ORAL: Data not available.

11.2 DERMAL: Data not available.

11.3 INHALATION: INH-RAT LC 50: 444 ppm (hydrogen sulfide)

11.4 CHRONIC and CARCINOGENICITY: No evidence available.

11.5 TERATOLOGY: Data not available.

11.6 REPRODUCTION: Data not available.

11.7 MUTAGENICITY: Data not available.

SECTION 12 – ECOLOGICAL INFORMATION

None Available

SECTION 13 – DISPOSAL CONSIDERATIONS

If released to the environment for other than its intended purpose, this product contains some reactive sulfides but not a sufficient quantity to meet the definition of a D003, hazardous waste. The pH may be high enough to meet the definition of a corrosive waste, D002.

SECTION 14 – TRANSPORT INFORMATION

14.1 DOT SHIPPING NAME: Corrosive liquids, n.o.s.

14.2 DOT HAZARD CLASS: 8

14.3 UN/NA NUMBER: UN1760

14.4 PACKING GROUP: II

14.5 DOT PLACARD: Corrosive

14.6 DOT LABLE(s): Corrosive

14.7 IMO SHIPPING NAME: Sodium Hydroxide Solution

14.8 RQ (REPORTABLE QUANTITY): 1,000 lbs (454 Kg) 100% basis (Approx. 538 gals)

14.9 USCG BARGE CERTIFICATION: SSH (sodium sulfide, hydrosulfide solutions, H2S 15 ppm or less). SSI (sodium sulfide, hydrosulfide solutions, H2S greater than 15 ppm but less than 200 ppm).

SECTION 15 – REGULATORY INFORMATION

15.1 OSHA: This product is listed as a hazardous material under criteria of the Federal OSHA Hazard Communication Standard, 29 CFR 1910.1200.

15.2 SARA TITLE III. a. EHS (Extremely Hazardous Substance) List:

b. Sections 311 and 312 (Tier I, II) Categories:

Immediate (acute)	Yes
Fire	No
Sudden Release	No
Reactivity	Yes
Delayed (chronic)	No

c. Section 313 (Toxic Release Report-Form R): No

d. TPQ (Threshold Planning Quantity): No

15.3 CERCLA and SUPERFUND: RQ (Reportable Quantity) 1,000 lbs

15.4 TSCA (Toxic Substance Control Act) Inventory List: Yes

15.5 RCRA (Resource Conservation and Recovery Act) Status: Yes

15.6 WHMIS (Canada) Hazard Classification: E, D1

15.7 DOT HAZARDOUS MATERIAL: (See Section 14) Yes

15.8 CAA HAZARDOUS AIR POLLUTANT (HAP): No

SECTION 16 – OTHER INFORMATION

REVISIONS: The entire MSDS was reformatted to comply to ANSI Standard Z400.1-1993.